

## REMARKS

Favorable reconsideration is respectfully requested.

The claims are 12-16.

The above amendment is responsive to points set forth in the Official Action.

In this regard, it is now recited in main claim 12 that H<sub>2</sub>O<sub>2</sub> is present at 40-60% strength, which is the preferred range disclosed on page 6, line 19 of the present specification.

Further, the preferred amount of homogenous molybdate catalyst is now recited based on the disclosure of page 6, lines 15-16 of the present specification.

The significance of the above amendment will become further apparent from the remarks below.

Claims 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton et al. (J. Chem. Soc., Perkin Transactions 1, 1975, pp. 1610-1614), in view of Van Laar et al. (Chem. Commun., pp. 267-268).

The rejection states that it would have been *prima facie* obvious to one skilled in the art to arrive at the presently claimed invention, because Barton teaches an oxidation process which consists of adding 30% hydrogen peroxide to hydrophobic organic substrates in an organic solvent in the presence of a homogenous catalyst (ammonium or sodium molybdate) and Van Laar teaches that singlet oxygen is generated as a reactive species, from alkaline hydrogen peroxide in the presence of a homogenous metal ion catalyst such as molybdate.

This rejection is respectfully traversed.

As already discussed in the remarks of record, Van Laar clearly teaches that homogenous catalysts such as molybdate produce <sup>1</sup>O<sub>2</sub>, which was also state of the art, i.e. common knowledge to the art-skilled, at the time the present invention was made. See, e.g. Aubry, J. Org. Chem. 1989, 54, pp. 726-728, who teaches on page 726, column 1, that molybdate ions catalyze disproportionation of hydrogen peroxide in basic solution. In the Experimental Section, it can be seen that Aubry uses sodium molybdate in combination with sodium hydrogen carbonate.

In contrast, note the presently recited “consisting essentially of” format, which excludes the use of soluble bases, i.e. in addition to the molybdate, which itself can be alkaline. Thus, the present claims exclude an important element which was thought to be needed to produce  $^1\text{O}_2$  at the time that the present invention was made.

Further, the present claims recite a strength of the  $\text{H}_2\text{O}_2$ , i.e. 40-60% , which is higher than the 30% strength taught by Barton.

Still further, the cited references do not appreciate the desirability of employing the presently recited 5-25 mol% homogenous molybdate catalyst.

Additionally, Barton teaches that the benzamide V is oxidized to the corresponding hydroperoxy-dienone (VII) with singlet oxygen if cerium (IV) oxide -hydrogen peroxide is used at an optimum temperature of 60-70°C.

On the other hand, according to Barton, if the benzamide is treated with ammonium or sodium molybdate - hydrogen peroxide, no hydroperoxy compound is produced, but rather, the corresponding quinone (VI), which suggests to an art-skilled person, especially in view of Van Laar, that this reaction does not proceed via singlet oxygen.

According to the present invention, peroxo-compounds are also produced, which would not be expected from the cited references.

Further, the rejection states that the recycling of the same material catalysts taught by Barton would be an obvious procedure.

Applicants respectfully disagree.

According to Barton, the reaction mixture is treated with water and then extracted. There is absolutely no suggestion in Barton that the catalyst could precipitate out and could therefore be separated by simple filtration or centrifugation and further be recycled.

Since the entire reaction according to the present application proceeds completely homogeneously when molybdate catalysts in an alcohol are used, it is surprising that the catalyst precipitates out after all of the  $\text{H}_2\text{O}_2$  has been added, and therefore unexpectedly facilitates removal of the catalyst, as presently recited.


For the foregoing reasons, it is considered that the rejection on Barton in view of Van Laar is untenable and should be withdrawn.

No further issues remaining, allowance of this application is respectfully requested.

If the Examiner has any comments or proposals for expediting prosecution, please contact undersigned at the telephone number below.

Respectfully submitted,

Jean-Marie AUBRY et al.

By:   
Matthew M. Jacob  
Registration No. 25,154  
Attorney for Applicants

MJ/da  
Washington, D.C. 20006-1021  
Telephone (202) 721-8200  
Facsimile (202) 721-8250  
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